farm" and other matters being mentioned and illustrated in such a manner as to take for granted an amount of previous knowledge that very few readers could possibly have possessed.

Although so remote and so small, Lord Howe Island supports an indigenous flora of a highly interesting character, especially interesting because it includes some plants whose nearest allies are natives of New Zealand. The island is about 300 miles from Port Macquarie, the nearest point of the Australian mainland, in 31° 30′ S. latitude. It is seven miles long, with an average breadth of about a mile, and the basalt mountains rise to a height of nearly 3000 feet. The soil is fertile, and is, or rather was, everywhere covered with vegetation. The scenery is beautiful; the climate is described as unsurpassable, and a great future is predicted for the island as a sanatorium, "when the Australian colonies become more densely inhabited." Without waiting for the time when Australia will be crowded with inhabitants, Lord Howe Island might be made a pleasant holiday resort, involving just enough of a sea voyage to be exciting and exhilarating, and not long enough to be monotonous.

The most complete account of the flora yet published is by Mr. Charles Moore, Director of the Botanic Gardens, Sydney, N.S.W., though many of the new plants then—1869—collected by him have since been published in various books and periodicals. The dominating feature in the vegetation is composed of palms, of which there are three or four species peculiar to this island—a condition of things paralleled in remote insular floras only in the Seychelles. Next in interest and prominence are the four or five endemic species of tree ferns, which, however, we are informed, in the illustrated report referred to, by the Hon. J. Bowie Wilson (botany by Mr. J. Duff), are fast disappearing from the lowlands, and will soon be extinct if their removal is not absolutely prohibited. In this connection one is gratified to find both the chief of the Commission of Exploration, and the botanist attached thereto, strongly urging the Government to take active steps to preserve the beautiful vegetation of the island, and especially to make no concessions, nor grant any leases that might entail any further destruction of the woods. Commonest among the other trees are *Hibiscus Patersonii*, *Myoporum acuminatum*, and *Ochrosia elliptica*—all three Australian trees; one or more species of *Ficus*, and one or more endemic species of screw-pine. One of the vegetable wonders of the island is a huge banyan-tree (*Ficus* sp.), said to cover three acres of ground; but no particulars are given of this remarkable tree, beyond a photograph of a portion of it. This is rather disappointing, because of all the famous banyan-trees in India, some of which are encouraged by artificial means in the development of the aërial descending roots, which eventually become auxiliary trunks, few surpass in size this one, on such a speck of an island. The celebrated banyan between Poona and Kolapore, in the Bombay Presidency, is, indeed, the only one, of which I have found a record, that covers a greater area than the Lord Howe Island banyan, and that, according to measurements given of the spread of its branches, must cover between six and seven acres.

In striking contrast to the flora of Australia, the flora of Lord Howe Island, like that of New Zealand, contains exceedingly few species of the large natural order Leguminosæ. Out of five species collected, three are common sea-side plants that often establish themselves on a shore from seeds cast up by the waves. Of the other two, one belongs to the otherwise exclusively New Zealand genus *Carmichaelia*, and the other, *Sophora chrysophylla*, is also a native of the mountains of the Sandwich Islands, and has hitherto been found nowhere between these two distant parts of the immense Pacific Ocean, and nowhere else in the world. From the foregoing notes may be gathered what an interesting flora that of Lord Howe Island is, and it is to be hoped that the recommendations of the Commissioners for its preservation have been carried out by the Government of New South Wales.

W. Botting Hemsley.

NOTES.

At the meeting of the Royal Geographical Society on Monday, it was announced that the following awards had been made:—To Sir James Hector, M.D., F.R.S. (Director of the Geological Survey, &c., of New Zealand), Royal Medal; to Dr. Fridtjof Nansen, Royal Medal; to Mr. William Ogilvie, the Murchison grant; to Mr. W. J. Steains, the Back grant (one year); to Dr. David Kerr Cross, the Back grant (one year); to Lieutenant B. L. Sclater, R.E., the Cuthbert Peek grant; to Mr. A. E. Pratt, the Gill memorial.

The next ordinary general meeting of the Institution of Mechanical Engineers will be held on Thursday evening, April 30, and Friday evening, May 1, at 25 Great George Street, Westminster. The chair will be taken at half-past seven p.m. on each evening by Mr. Joseph Tomlinson, the President. The following papers will be read and discussed, as far as time permits:—Research Committee on marine-engine trials: report upon trial of the steamer *Iona*, by Prof. Alexander B. W. Kennedy, Chairman; on some details in the construction of modern Lancashire boilers, by Mr. Samuel Boswell, of Manchester. The anniversary dinner will take place on Wednesday evening, April 29.

At the Physical Society, on Friday, in addition to the papers already announced, an account will be given, by Prof. Silvanus P. Thompson, of erecting prisms for the optical lantern. A new prism by Mr. Ahrens will be exhibited.

The Kew Committee of the Royal Society have given notice that they are prepared to examine, at the Kew Observatory, photographic lenses, for the purpose of testing them and of certifying their performance.

The twenty-second annual meeting of the Norfolk and Norwich Naturalists' Society was held in the Norwich Museum on March 31 last, Mr. Henry Seebohm, the President, in the chair. Dr. F. D. Wheeler was elected President for the ensuing year. The Treasurer's report showed that the Society was in a sound position financially, and that the present number of members is 254. Mr. Seebohm read his presidential address, and referred to the loss the Society had sustained by the death of Mr. J. H. Gurney and Mr. John Gunn.

Writing on April 4, a Constantinople correspondent of the Vienna *Vaterland* says that, on the preceding day, the hamlet of Adil-Djevas, in the district of Van, in Armenia, had been destroyed by an earthquake. One hundred and forty-six houses had been destroyed, 240 other buildings had been much injured, and hundreds of lives had been lost.

According to a telegram sent through Reuter's Agency, a large body of water has been discovered at El Golea, in the Sahara Desert, about 120 feet below the surface. It throws up nearly forty gallons per minute at present, and it is anticipated that the yield will be much greater when more perfect access to the water is attained. The discovery is regarded as of high importance, as this is the first time that water has been found in the Sahara at such a slight depth underground.

A lady sends the following note on a meteor seen by her to pass across the sky from north-west to south-east about 7.20 p.m., March 26. It was seen from the bridge over the River Fal, at Ruanlanihorn, Cornwall:—"Body very bright, brilliant white light, towards the back a slight flame-like appearance, a slight delicate tail rather more inclined to reddish light.

It travelled fast across the sky, and I saw it first when just about the highest centre, and it disappeared to the south-east behind the hill (our copse and glebe), which was just in front of me as I was crossing the sette on my way home. It travelled fast, but not nearly so fast as any meteor I have ever seen before; but with a quick rate, of steady perceptible time."

Among the results already obtained from the oceanographic expedition of the *Pola*, organized by the Academy of Sciences of Vienna, are the following:—The water of the central basin of the Mediterranean was found to be warmer, denser, and richer in dissolved salts, than the western basin. As regards the penetration of light into the sea, a white disk was visible only at a depth of 43 m., but photographic plates were affected at a depth of 500 m. Starting from the surface of the sea, the quantity of oxygen dissolved at first increases with the decrease of temperature; but then again decreases, so that at a depth of 3000 m. the proportion is the same as that at the surface. In no case was any free carbonic acid found. The nitrogenous substances in solution vary in inverse proportion to the depth; that of ammonia varies but slightly, but is greater in the lower strata.

In the course of excavations which are being carried out in the neighbourhood of Vienna by the Academy of Sciences, a cavern was lately discovered on the slope of the mountain at Baden. A correspondent writes to the *Times*:—"It was plain on a cursory inspection that the cavern had been used not only in the Middle Ages, but long previously. At the time of the Roman occupation Baden was the encampment of a veteran legion who were well acquainted with the good qualities of the waters. Decided remains of the foundations of a vestibule were found at the entrance of the cave. In a niche hewn out of the rock was an altar with the sacrificial stone table. In front of the cavern was a regularly-constructed building, fully 10 feet below the surface of the ground above, designed probably to conceal the cavern behind, which was most probably employed as a temple to Mithras. There were two stalls for horses, fragments of utensils, knives, flint arrow-heads, carved bones, mixed up with Roman coins, lamps, and stamped tiles."

At the meeting of the French Meteorological Society on March 3, a communication from M. Marès showed that the weather in Algeria had been as remarkable during the last winter as in Europe. The author stated that in many localities the excessive rainfall had prevented the sowing of seeds, and in the mountainous districts, where the sowing had taken place early, the seed had been swept away by the torrents. About the third week in January a heavy fall of snow lay on the Mitidja and the Sahel for two whole days; the writer states that for the last thirty-five years, although he had sometimes seen snow fall, it did not lie an instant on the ground. The effects had been disastrous to early crops and to many animals.

The April number of *Himmel und Erde* contains an article by Dr. W. J. van Bebber, of the Deutsche Seewarte, on the typical weather conditions of winter. The writer shows very clearly by means of charts how the disposition of barometric pressure over the Atlantic and the continent of Asia regulates the weather over Western Europe. Nearly twenty years ago the synoptic charts issued by Captain Hoffmeyer, of the Danish Meteorological Institute, showed that there were three large areas of very low barometric pressure in the Atlantic, the most important being south-west of Iceland, and two smaller areas, one on the eastern side towards the northern Arctic Ocean, and another on the west side towards Davis Straits. These areas cause the westerly and south-westerly winds which bring the damp and warm air over Europe. The shifting of their positions causes the variations in our wind-system. M. L. Teisserenc de Bort has pointed out the important part also played by areas of high barometer, which has given greater importance to the Danish synoptic charts. The most important area of high pressure for Western Europe is that stretching eastwards over the Azores and Madeira. If this area shifts north-eastwards towards France, it blocks the way of the air over the ocean, and the weather becomes foggy and cold. Another important barometric maximum persists over Central Asia. This maximum is subject to frequent modifications; sometimes it splits up into two parts, one of which not rarely shifts as far westwards as Scandinavia, and produces a persistence of cold easterly winds over Western Europe—especially when the pressure over Southern Europe is low, which was generally the case in the past winter.

The new number of the *Mineralogical Magazine* opens with a paper on cassiterite, "sparable tin," from Cornwall, by R. H. Solly. The other papers are: twins of marcasite in regular disposition upon cubes of pyrites, by C. O. Trechmann; the tetartohedrism of ullmannite, by H. A. Miers; a student's goniometer, by H. A. Miers; on an eclogite from Loch Duich, by J. J. H. Teall, F.R.S.; on a micro-granite containing riebeckite from Ailsa Craig, by J. J. H. Teall, F.R.S.; on occurrences of riebeckite in Britain, by Grenville A. J. Cole; on a rapid method for the accurate recognition of sulphides, arsenides, antimonides, and double compounds of these bodies with metals, by Charles A. Burghardt; a system for constructing crystal forms by the plaiting of their zones, by J. Gorham. There are also reviews and abstracts.

Our young contemporary *Neptunia*, published at Venice, includes in its programme an account of the existing biological stations in various parts of the world. In its first number (January 1891) there is an historical sketch of the work done in the Marine Laboratory of Luc-sur-Mer, Normandy, attached to the Faculty of Sciences at Caen. Established in 1883 at the suggestion of Prof. Deslongchamps, of Caen, and supported by a grant of 30,000 fr. from the Council-General of the Calvados, it has since been under the direction, successively, of Profs. Delage and Laffine. During the seven years of its existence some admirable biological work has been done in this laboratory, the results of which have been published in the French scientific journals. The researches carried on in 1888–89 include a "Memoir on the Organization of the Chætoptera," by Prof. Laffine; "Researches on the Lower Algæ," by M. E. Dangeard; "Researches on the Sponges of the Manche," by M. Topset; "On the ink-bag of the Mollusca," by M. Letellier. In a later number of the same journal there are accounts of the movable zoological station of the Committee for the Exploration of Bohemia, and of the marine zoological laboratory at Rapallo.

In a recent report by Lord Vaux of Harrowden, Secretary to the British Legation at Stuttgart, on agriculture in Würtemberg, reference is made to agricultural education in that State. This is cared for by numerous schools and societies, and appears to be fully appreciated by the peasants and others. Almost every institution of this sort had greater demands made upon it in 1889 (the year to which the report specially refers) than in the previous year. The Agricultural and Gardening School had its normal number of students; the School of Vineyards, in consequence of increasing demands for tuition in this branch, was again forced to exceed its statutory number of pupils; the Agricultural Winter School was attended by 103 scholars, being an increase of six on the previous year. A sixth school was added to the five already in existence for teaching country girls and young women farmhouse and dairy work. The travelling teachers of husbandry, as well as those specially devoted to orchards and vineyards were in great request among local societies and by the communal authorities. Sixty-four students attended the lectures upon orchard cultivation; ninety-two farriers were taught at the various veterinary colleges and schools throughout the country. The winter evening agricultural schools, reading clubs, and local libraries all showed a considerable increase both in numbers and in attendance. Altogether some 23,400 persons attended agricultural schools or lectures on husbandry during the year. This is rather more than 1 per cent. of the total population of the country, and is good evidence that the people as a rule do not neglect the opportunities given them of becoming successful agriculturists.

BORON IODIDE, BI_3, has been prepared by M. Moissan, and its properties, which are of a somewhat remarkable nature, investigated. It may be obtained in three ways: (1) by leading gaseous hydriodic acid mixed with the vapour of boron chloride, BCl_3, through a porcelain tube heated to redness; (2) by the action of iodine upon boron at a temperature of 700°–800° C.; (3) by the action of hydriodic acid gas upon amorphous boron. The third method affords the best means of preparing the new substance in quantity. A current of gaseous hydriodic acid is first well dried by passage through porous calcium iodide; it is then led over amorphous boron contained in a hard glass tube heated to a temperature approaching that of the softening of the glass. At the commencement of the experiment a small quantity of iodine vapour makes its appearance, and is allowed to escape. When this ceases a dry receiver is attached to the end of the combustion tube, and a more or less deeply coloured crystalline product begins to collect. In a short time the reaction becomes very energetic, large quantities of the crystalline body being deposited, of a bright reddish-purple colour, and almost pure hydrogen escaping. The coloration is due to a small quantity of admixed iodine, for if the solid product is treated with carbon bisulphide it entirely dissolves, forming a solution of the same colour as that of iodine in carbon bisulphide, and which is rendered colourless by agitation with mercury. The solution in carbon bisulphide deposits on evaporation colourless transparent tabular crystals, somewhat nacreous in appearance, of pure boron iodide. The crystals are very sensitive to light; their colourless solution in carbon bisulphide becomes deep red in half an hour, owing to the liberation of iodine under the influence of diffused daylight. The crystals melt at 43° to a liquid which boils undecomposed at 210°, without any appearance of free iodine vapours. The crystals are exceedingly hygroscopic, attracting moisture with great rapidity, and thereby suffering decomposition. In contact with water itself the decomposition is instantaneous, boric and hydriodic acids being formed, $BI_3 + 3H_2O = H_3BO_3 + 3HI$. When heated in air or oxygen, boron iodide burns readily with a brilliant flame deeply coloured with iodine vapour, clouds of boric anhydride, B_2O_3, being also produced. Melted sulphur attacks it likewise with considerable energy, iodine volatilizing, and a substance being formed which on the addition of water yields a precipitate of sulphur and evolves sulphuretted hydrogen, presumably a sulphide of boron. Phosphorus reacts in the cold with incandescence. With oxychloride of phosphorus, $POCl_3$, a crystalline compound appears to be formed with considerable rise of temperature. Silver fluoride at once invokes incandescence, a violent evolution of gaseous fluoride of boron, BF_3, occurring together with formation of silver iodide. Ethyl alcohol likewise reacts with rise of temperature, a product being obtained which on distillation yields ethyl iodide, the residue consisting of boric acid, $3C_2H_6O + BI_3 = H_3BO_3 + 3C_2H_5I$. Ethyl ether forms with boron iodide a brown liquid, also with considerable evolution of heat, which appears to consist of ethyl iodide and boric ether: $3(C_2H_5)_2O + BI_3 = 3C_2H_5I + B(OC_2H_5)_3$; for on the addition of water to the product, ethyl iodide, boric acid, and alcohol are obtained.

THE additions to the Zoological Society's Gardens during the past week include a Spiny-tailed Mastigure (*Uromastix acanthinurus*) from Algeria, presented by Mrs. W. Williams; two Chipping Squirrels (*Tamias striatus*) from North America, presented by Mr. A. W. Jutson; a Brown Milvago (*Milvago chimango*) from South America, presented by Mr. J. Mand; three Puff Adders (*Vipera arietans*) from the Cape of Good Hope, three Egyptian Cobras (*Naia haje*) from Africa, presented by the Rev. G. H. R. Fisk, C.M.Z.S.; a Tuatera Lizard (*Sphenodon punctatus*) from New Zealand, presented by Mr. Thos. E. Phillips; a Red-spotted Lizard (*Eremias rubro-punctatus*) from the Pyramids of Dashoor, presented by Dr. Drewitt; two Scorpions from Alexandria, presented by Mr. Sidney R. Carver; three Partridge Bronze-winged Pigeons (*Geophaps scripta*), a Brush Bronze-winged Pigeon (*Phaps elegans*), three Maned Geese (*Bernicla jubata*) from Australia, purchased.

OUR ASTRONOMICAL COLUMN.

THE SOLAR CORONA.—The fourteenth number of the Publications of the Astronomical Society of the Pacific contains several notes on the solar corona. Prof. Charroppin gives the results of an investigation into photographs of the corona, and recommends the following methods in order to obtain greater extension of coronal streamers: (1) to use orthochromatic plates; (2) the greatest precaution to guard from all foreign light; (3) short exposures to obtain the polar filaments and the inner corona; (4) long exposures to secure the extension of the outer corona; (5) photographing each wing separately, and keeping the brighter part of the eclipse out of the field. Prof. Frank H. Bigelow gives a brief summary of the result of a discussion of a photograph of the corona streamers of the eclipse of July 29, 1878, according to the law of equipotential surfaces. He shows that the repulsion of the surfaces of infinitesimally small particles, obeying this law, is all that is required as a fundamental conception, in order to arrive at a physical interpretation of the facts. Lastly, Mr. Schaeberle gives a short account of the principles and results of the mechanical theory of the corona, to which reference has been made in a previous number (NATURE, vol. xlii. p. 68). The full account of the investigation will appear in a report to be issued by the State Legislature. Beginning with the theorems, that (1) the eruptions on the sun's surface are most active and numerous in the sun-spot zones; (2) the sun rotates about an axis passing through its centre; (3) this axis is inclined to the plane of the earth's orbit at an angle of about 82¾°, Mr. Schaeberle derives formulæ which give results showing "that the observed shapes of the equatorial extension or wings of the corona can be satisfactorily accounted for by supposing them to be the envelopes of systems of streamers ejected from the sun-spot zones with initial velocities of less than 380 miles per second (such velocities as have been observed in the higher regions of the prominences, for example)." He then shows on mechanical principles that the curious forms of the "polar rays," which are seen in any corona can be produced by the perspective overlapping of systems of nearly right line streamers originating within the sun-spot zones, and have therefore no objective existence. The *résumé* given by Mr. Schaeberle is a proof that he has thoroughly worked out his theory, and tested its capability of explaining the numerous coronal forms. We therefore look forward with interest to the publication of the Eclipse Report, containing the extended argument in favour of a theory which certainly rivals all others in simplicity.

THE PHOTOGRAPHIC CHART.—A recently published *Bulletin du Comité international permanent pour l'exécution photographique de la Carte du Ciel* is distinguished by several interesting and important articles. M. Kapteyn and M. Gautier contribute notes on the construction and use of the apparatus for the measurement of the photographs, and Dr. Scheiner describes a simple method used at Potsdam for the exact orientation of the telescope. In a paper on the law of photographic diameters of stellar disks, Max Wolf compares the disks of Polaris and neighbouring stars, and the group G.C. 4410, obtained by exposures varying, in geometrical progression, from 1 to 1024 seconds, and deduces the conclusion that the increase